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PATENT AND TRADEMARK OFFICE

Applicants: J. Joyce et al.

Serial No.: 08/409,122 - Case No.: 19425

Art Unit:
1815

Filed: March 22, 1995

For: RECOMBINANT HUMAN PAPILLOMA-
VIRUS TYPE 18

Examiner:
Salimi, A.

The Honorable Commissioner of Patents and Trademarks
The Drawing Review Branch
Washington, D.C. 20231

SUBMISSION OF FORMAL DRAWINGS

Dear Sir:

Enclosed please find seven pages of formal drawings for the above referenced case.

Respectfully submitted,

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Date: January 13, 1998

5820870

10 20 30 40 50 60
ATGGCTTTGTGGCGGCCTAGTGACAATACCGTATACCTTCCACCTCCTTCTGTGGCAAGA
1 M A L W R P S D N T V Y L P P P S V A R 20
70 80 90 100 110 120
GTTGTAAATACTGATGATTATGTGACTCGCACAAGCATATTTTATCATGCTGGCAGCTCT
21 V V N T D D Y V T R T S I F Y H A G S S 40
130 140 150 160 170 180
AGATTATTAAGTGTGGTAATCCATATTTTAGGGTTCCCTGCAGGTGGTGGCAATAAGCAG
41 R L L T V G N P Y F R V P A G G G N K Q 60
190 200 210 220 230 240
GATATTCCTAAGGTTTCTGCATACCAATATAGAGTATTTTCGGGTGCAGTTACCTGACCCA
61 D I P K V S A Y Q Y R V F R V Q L P D P 80
250 260 270 280 290 300
AATAAATTTGGTTTACCTGATAATAGTATTTATAATCCTGAAACACAACGTTTAGTGTGG
81 N K F G L P D N S I Y N P E T Q R L V W 100
310 320 330 340 350 360
GCCTGTGCTGGAGTGGAAATTGGCCGTGGTCAGCCTTTAGGTGTTGGCCTTAGTGGGCAT
101 A C A G V E I G R G Q P L G V G L S G H 120
370 380 390 400 410 420
CCATTTTATAATAAATTAGATGACACTGAAAGTTCCCATGCCGCTACGTCTAATGTTTCT
121 P F Y N K L D D T E S S H A A T S N V S 140
430 440 450 460 470 480
GAGGACGTTAGGGACAATGTGTCTGTAGATTATAAGCAGACACAGTTATGTATTTGGGC
141 E D V R D N V S V D Y K Q T Q L C I L G 160
490 500 510 520 530 540
TGTGCCCCCTGCTATTGGGGAACACTGGGCTAAAGGCACTGCTTGTAATCGCGTCCTTTA
161 C A P A I G E H W A K G T A C K S R P L 180
550 560 570 580 590 600
TCACAGGGCGATTGCCCCCTTTAGAACTTAAGAACACAGTTTTGGAAGATGGTGATATG
181 S Q G D C P P L E L K N T V L E D G D M 200
610 620 630 640 650 660
GTAGATACTGGATATGGTGCCATGGACTTTAGTACATTGCAAGATACTAAATGTGAGGTA
201 V D T G Y G A M D F S T L Q D T K C E V 220
670 680 690 700 710 720
CCATTGGATATTTGTCAGTCTATTTGTAAATATCCTGATTATTTACAAATGTCTGCAGAT
221 P L D I C Q S I C K Y P D Y L Q M S A D 240
730 740 750 760 770 780
CCTTATGGGGATTCCATGTTTTTTTGCTTACGACGTGAGCAGCTTTTGTAGGCATTTT
241 P Y G D S M F F C L R R E Q L F A R H F 260
790 800 810 820 830 840
TGAATAGGGCAGGTACTATGGGTGACACTGTGCCTCAATCCTTATATATTAAGGCACA
261 W N R A G T M G D T V P Q S L Y I K G T 280

FIG. 1A

850 860 870 880 890 900
 GGTATGCGTGCTTCACCTGGCAGCTGTGTGATTCTCCCTCTCCAAGTGGCTCTATTGTT
 281 G M R A S P G S C V Y S P S P S G S I V 300
 910 920 930 940 950 960
 ACCTCTGACTCCCAGTTGTTTAATAAACCATATTGGTTACATAAGGCACAGGGTCATAAC
 301 T S D S Q L F N K P Y W L H K A Q G H N 320
 970 980 990 1000 1010 1020
 AATGGTATCTGCTGGCATAATCAATTATTTGTTACTGTGGTAGATACCACTCGTAGTACC
 321 N G I C W H N Q L F V T V V D T T R S T 340
 1030 1040 1050 1060 1070 1080
 AATTTAACAATATGTGCTTCTACACAGTCTCCTGTACCTGGGCAATATGATGCTACCAAA
 341 N L T I C A S T Q S P V P G Q Y D A T K 360
 1090 1100 1110 1120 1130 1140
 TTTAAGCAGTATAGCAGACATGTTGAAGAATATGATTTGCAGTTTATTTTTCAGTTATGT
 361 F K Q Y S R H V E E Y D L Q F I F Q L C 380
 1150 1160 1170 1180 1190 1200
 ACTATTACTTTAACTGCAGATGTTATGTCCTATATTCATAGTATGAATAGCAGTATTTTA
 381 T I T L T A D V M S Y I H S M N S S I L 400
 1210 1220 1230 1240 1250 1260
 GAGGATTGGAACCTTTGGTGTTCACCCCCCGCCAACTACTAGTTTGGTGGATACATATCGT
 401 E D W N F G V P P P P T T S L V D T Y R 420
 1270 1280 1290 1300 1310 1320
 TTTGTACAATCTGTTGCTATTACCTGTCAAAAGGATGCTGCACCAGCTGAAAATAAGGAT
 421 F V Q S V A I T C Q K D A A P A E N K D 440
 1330 1340 1350 1360 1370 1380
 CCCTATGATAAGTTAAAGTTTTGGAATGTGGATTTAAAGGAAAAGTTTTCTTTGGACTTA
 441 P Y D K L K F W N V D L K E K F S L D L 460
 1390 1400 1410 1420 1430 1440
 GATCAATATCCCCTTGGACGTAAATTTTTGGTTTCAGGCTGGAATGCGTCGCAAGCCCACC
 461 D Q Y P L G R K F L V Q A G L R R K P T 480
 1450 1460 1470 1480 1490 1500
 ATAGGCCCTCGTAAACGTTCTGCTCCATCTGCCACTACGTCTTCTAAACCTGCCAAGCGT
 481 I G P R K R S A P S A T T S S K P A K R 500
 1510 1520
 GTGCGTGTACGTGCCAGGAAGTAA
 501 V R V R A R K * 508

FIG. 1B

AMINO ACID VARIATIONS IN L1 PROTEIN OF HPV18					
	<u>AMINO ACID POSITION IN L1</u>				
	<u>30</u>	<u>88</u>	<u>283</u>	<u>323</u>	<u>338</u>
HPV18 PUBLISHED	P	T	P	V	P
HPV18 MERCK	R	N	R	I	R
#354 (CLINICAL INDIANA)	R	N	R	V	R
#556	R	N	R	V	R
#755	-	-	R	V	R
#697	-	-	R	V	R
#795	-	-	R	V	R
#23 (CLINICAL PENNSYLVANIA)	-	-	R	I	R

FIG.2

	10	20	30	40	50	60	
	ATGGTATCCCACCGTGCCGCACGACGCAAACGGGCTTCGGTGACTGACTTATATAAAACA						
1	M	V	S	H	R	A	20
	70	80	90	100	110	120	
	TGTAACAATCTGGTACATGTCCATCTGATGTTGTTAATAAGGTAGAGGGCACCACGTTA						
21	C	K	Q	S	G	T	40
	130	140	150	160	170	180	
	GCAGATAAAATATTGCAATGGTCAAGCCTTGGTATATTTTGGGTGGACTTGGCATAGGT						
41	A	D	K	I	L	Q	60
	190	200	210	220	230	240	
	ACTGGAAGTGGTACAGGGGGTCGTACAGGGTACATTCCATTGGGTGGGCGTTCCAATACA						
61	T	G	S	G	T	G	80
	250	260	270	280	290	300	
	GTTGTGGATGTGCGTCCTACACGTCCTCCAGTGGTTATTGAACCTGTGGGCCCCACAGAC						
81	V	V	D	V	G	P	100
	310	320	330	340	350	360	
	CCATCTATTGTTACATTAATAGAGGACTCAAGTGTGTTACATCAGGTGCACCTAGGCCT						
101	P	S	I	V	T	L	120
	370	380	390	400	410	420	
	ACTTTTACTGGCACGTCTGGGTTTGATATAACATCTGCTGGTACAACCTACACCTGCAGTT						
121	T	F	T	G	T	S	140
	430	440	450	460	470	480	
	TTGGATATCACACCTTCGTCTACCTCTGTTTCTATTTCCACAACCAATTTTACCAATCCT						
141	L	D	I	T	P	S	160
	490	500	510	520	530	540	
	GCATTTTCTGATCCGTCCATTATTGAAGTTCACAAACTGGGGAGGTGTCAGGTAATGTA						
161	A	F	S	D	P	S	180
	550	560	570	580	590	600	
	TTTGTGTTGGTACCCCTACATCTGGAACACATGGGTATGAAGAAATACCTTTACAAACATTT						
181	F	V	G	T	P	T	200
	610	620	630	640	650	660	
	GCTTCTTCTGGTACGGGGGAGGAACCCATTAGTAGTACCCCATTCCTACTGTGCGGCGT						
201	A	S	S	G	T	G	220
	670	680	690	700	710	720	
	GTAGCAGGTCCCCGCCTTTACAGTAGGGCCTACCAACAAGTGTCTGTGGCTAACCCCTGAG						
221	V	A	G	P	R	L	240
	730	740	750	760	770	780	
	TTTCTTACACGTCCATCCTCTTTAATTACCTATGACAACCCGGCCTTTGAGCCTGTGGAC						
241	F	L	T	R	P	S	260
	790	800	810	820	830	840	
	ACTACATTAACATTTGAGCCTCGTAGTAATGTTCTGATTGAGATTTTATGGATATTATC						
261	T	T	L	T	F	E	280

FIG. 3A

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	850	860	870	880	890	900															
	CGTTTACATAGGCCTGCTTTAACATCCAGGCGTGGTACTGTGCGCTTTAGTAGATTAGGT																				
281	R	L	H	R	P	A	L	T	S	R	R	G	T	V	R	F	S	R	L	300	
	910	920	930	940	950	960															
	CAAAGGGCAACTATGTTTACCCGTAGCGGTACACAAATAGGTGCTAGGGTTCACTTTTAT																				
301	Q	R	A	T	M	F	T	R	S	G	T	Q	I	G	A	R	V	H	F	Y	320
	970	980	990	1000	1010	1020															
	CATGATATAAGTCCTATTGCACCCTCCCCAGAATATATTGAACTGCAGCCTTTAGTATCT																				
321	H	D	I	S	P	I	A	P	S	P	E	Y	I	E	L	Q	P	L	V	S	340
	1030	1040	1050	1060	1070	1080															
	GCCACGGAGGACAATGGCTTGTTTGATATATATGCAGATGACATAGACCCTGCAATGCCT																				
341	A	T	E	D	N	G	L	F	D	I	Y	A	D	D	I	D	P	A	M	P	360
	1090	1100	1110	1020	1030	1040															
	GTACCATCGCGTCTACTACCTCCTCTGCAGTTTCTACATATTCGCCCCACTATATCATCT																				
361	V	P	S	R	P	T	T	S	S	A	V	S	T	Y	S	P	T	I	S	S	380
	1150	1160	1170	1180	1190	1200															
	GCCTCTTCCTATAGTAATGTAACGGTCCCTTTAACCTCCTCTTGGGATGTGCCTGTATAC																				
381	A	S	S	Y	S	N	V	T	V	P	L	T	S	S	W	D	V	P	V	Y	400
	1210	1220	1230	1240	1250	1260															
	ACGGGTCCTGATATTACATTACCACCTACTACCTCTGTATGGCCCATTGTATCACCACA																				
401	T	G	P	D	I	T	L	P	P	T	T	S	V	W	P	I	V	S	P	T	420
	1270	1280	1290	1300	1310	1320															
	GCCCTGCCTCTACACAGTATATTGGTATACATGGTACACATTATTATTTGTGGCCATTA																				
421	A	P	A	S	T	Q	Y	I	G	I	H	G	T	H	Y	Y	L	W	P	L	440
	1330	1340	1350	1360	1370	1380															
	TATTATTTTATTCCCTAAAAAGCGTAAACGTGTTCCCTATTTTTTTGCAGATGGCTTTGTG																				
441	Y	Y	F	I	P	K	K	R	K	R	V	P	Y	F	F	A	D	G	F	V	460
	GCGGCCTAG																				
461	A	A	*																		463

FIG. 3B

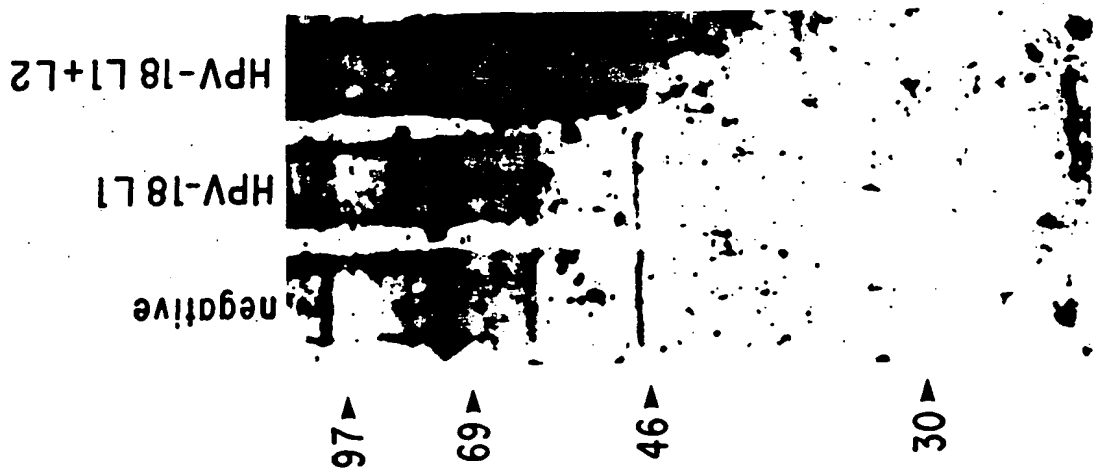


FIG.5



FIG.4



FIG.6